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2000

OFFICE OF ASSET MANAGEMENT

U.S. Department of Transportation
Federal Highway Administration

CONTENTS

NOTE FROM
THE DIRECTOR

OFFICE OF ASSET MANAGEMENT,
INFRASTRUCTURE CORE BUSINESS UNIT,
FEDERAL HIGHWAY ADMINISTRATION

The Federal Highway Administration's Office of Asset Management is pleased to present this, our first *Annual Report*. The Office is charged with providing tools, techniques, and information to support the stewards of the Nation's transportation system as they work to ensure that the traveling public—both today and in the future—will enjoy a transportation system maintained and operated to the highest and most cost-effective standards.

The Office of Asset Management looks at the entire highway system from a financial and user point of view, as well as from the engineering perspective. Today's highway users expect and even demand a highway system that is reliable and efficient. Users of today's system ask whether their tax dollars are being spent wisely on the maintenance and operation of our highway network. They want less congestion, as well as roads that are built better and safer, and last longer.

Transportation Asset Management is a business process and a decision-making framework that covers an extended time horizon and considers a broad range of assets. The Asset Management approach incorporates the economic assessment of trade-offs between alternative investment options, both at the project level and at the system level, and presents this information to management to assist in making investment decisions.

This Report describes the many projects we have underway. In the coming year, several of these projects will come to fruition. We look forward to ongoing work with our partners throughout the country as we apply Asset Management tools and principles to the construction and maintenance of our Nation's highways.

Madeleine Bloom

Madeleine Bloom
Director
Office of Asset Management

THE OFFICE OF **ASSET MANAGEMENT:** ITS MISSION

The specific mission of the Office of Asset Management is to provide leadership and expertise in the systematic management of highway infrastructure assets and the public's investment. The Office has the following key responsibilities:

- Provide national leadership in Asset Management principles for highway program administration;
- Develop Asset Management principles for individual assets such as pavement, bridge, and system preservation;
- Develop investment analysis tools and techniques; and
- Partner with governmental groups at the Federal, State, and local levels, as well as with academia and private industry, to conduct nationwide programs.

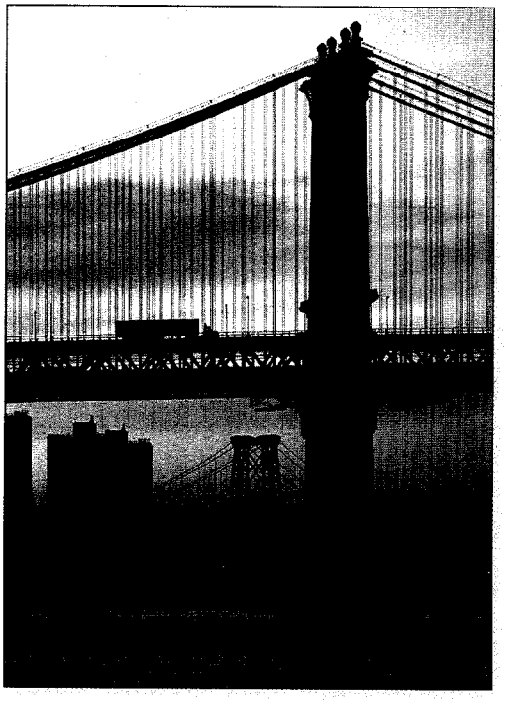
The Office of Asset Management serves as an advocate for Asset Management; for system preservation; for pavement management and analysis; for bridge management and inspection; for construction and maintenance activities; for engineering/economic analysis applications; and for technology development, outreach, and partnering initiatives.

THE WHAT AND WHY OF
ASSET MANAGEMENT

The Office of Asset Management was established within the Federal Highway Administration (FHWA) as part of FHWA's efforts to reorganize and make the agency more responsive to the evolving needs of its customers.

The Office develops, enhances, delivers, and promotes the use of tools and techniques to support the implementation of Asset Management concepts and principles. These tools and techniques are delivered through technical assistance and training services.

Cooperative arrangements with organizations such as the American Association of State Highway and Transportation Officials (AASHTO), the Transportation Research Board (TRB), and industry associations are a top priority of the Office. "Partnership" is a guiding theme in the work the Office undertakes, and its services are available to all State Departments of Transportation (DOTs) and others.



WHY TRANSPORTATION ASSET MANAGEMENT?

State and local transportation agencies entered this century facing a series of new and different challenges.

The responsibilities of these agencies shifted in focus from major highway construction projects, primarily the designing and building of the Interstate Highway System, to maintaining and preserving the existing system. This shift presents a complex range of challenges as user expectations for the system are increasing while demand continues to grow. Highways are more congested than ever in many parts of the country. Increasing demand and normal wear and tear subject the system to on-going deterioration.

Layered on top of these challenges is the fact that reductions in staff are occurring at the Federal and State level, as a result of government downsizing initiatives and the general aging of our highway workforce. A robust economy has also made it difficult for transportation agencies to compete for and retain capable personnel. Therefore, as transportation agencies lose experienced staff, they are finding that it makes sense to use more systematic approaches to decision-making.

Additionally, in States throughout the country, transportation budgets are competing with other budget demands. And legislative initiatives are directing transportation funds to activities outside traditional transportation projects.

Despite these changes, the public still expects governmental agencies to preserve and protect the transportation system they rely on. Public expectations have in fact risen: today transportation agencies are expected to communicate and explain their management approaches and results to elected officials and the general public.

Clearly, a new way of doing business is required to respond effectively to this mix of strong, competing demands. Although transportation agencies have been managing their assets for years, demands today require more systematic and thorough processes. State DOTs and other transportation agencies are moving from merely managing their assets to incorporating Asset Management into their business practices.

WHAT IS **ASSET MANAGEMENT**?

Asset Management is a new term to many. The Office recognized early on that a major effort would have to be undertaken to explain just what this new term means and what the Office does.

Asset Management is not a specific product or service, but rather a way of doing business that will apply differently from organization to organization. It is a framework for making decisions in order to use resources efficiently. "Assets" can take various forms—they can be people, money, information, and physical resources. The primary physical assets FHWA is focusing on are pavements, structures, tunnels, and hardware.

The Asset Management framework in broad terms consists of these elements:

- The establishment of performance expectations, consistent with goals, available budgets, and organization policies. These expectations guide the analytical and decision-making processes.
- The collection of inventory and performance information, to determine future system requirements.
- The use of analytical tools and reproducible procedures to provide cost-effective strategies for allocating budgets to satisfy agency needs and customer requirements, using performance expectations as critical inputs.
- Finally, the presentation of alternative choices, which are evaluated consistent with long-range plans, policies, and goals. Projects are then selected and programs implemented, with the entire process periodically reevaluated through performance monitoring.

WHAT ARE THE KEY ELEMENTS OF A TRANSPORTATION **ASSET MANAGEMENT** SYSTEM?

For an Asset Management system to be applied effectively to a transportation system, the following elements are essential:

There Must Be A Decision-Making Framework. Asset Management establishes a logical decision-making framework that incorporates principles from the disciplines of engineering, economics, and business. Results reflect a systematic, organized, logical, and reproducible approach.

It Must Be Analytically Based. Engineering, economic, performance, and behavioral models and associated data inputs provide the means to identify optimal investment strategies.

There Must Be Effective Communication. The organization must have an effective means for transmitting the information required by stakeholders—ranging from legislators to front-line practitioners. Information must also flow horizontally within the organization, across functions, asset classes, and modes.

The Work Must Be Goal Driven. Asset Management focuses on customer expectations along with the organizational features, policies, and budgets unique to each agency and legislative environment. Performance goals provide a way for transportation agencies to respond to the public's interest in how well their assets are being managed.

Alternatives Must Be Weighed: The "What If?" Analysis. The ability to weigh and articulate the impact of choosing one alternative over another is vitally important.

Fact-Based Dialogue Is Essential. Asset Management provides for fact-based dialogue among all interested parties. Relevant, objective, and credible information is available to all parties in the decision-making process.

OFFICE OF ASSET MANAGEMENT INITIATIVES 1999-2000

Three teams make up the Office of Asset Management: System Management and Monitoring, Construction and System Preservation, and Evaluation and Economic Investment. These teams have embarked on many technical initiatives implementing the essential principles of Asset Management—the information, tools, and technology needed to assist State and local transportation agencies in managing their highway resources, conducting investment analysis, and communicating the outcomes of their decisions to their constituents and policy makers.

The **System Management and Monitoring Team** focused on developing, refining, and promoting management systems for pavements, bridges, and other highway assets. The outcome of this team's work is evident in the following initiatives:

- The ongoing development of an implementation strategy for new standards to measure pavement roughness, rutting, and faulting. These pavement distress standards were approved by AASHTO during Fiscal Year (FY) 2000 and were presented at several workshops throughout the country during the year. The implementation strategy for the new standards is being devised in partnership with States, AASHTO, equipment manufacturers, and others.
- Documentation during FY 2000 of how three States use pavement management systems to track the performance of Superpave projects. This tracking information is critical to determining the long-term durability and cost-effectiveness of the Superpave system. A fourth State will be added to the study, which is scheduled to conclude in March 2001.
- A study of seven States where pavement management systems have been used to track the performance and pavement life extension resulting from scheduled preventive maintenance activities such as crack sealing, surface seals, and similar treatments. This study, which is near completion, addresses the concerns expressed by our State partners regarding the performance of preventive maintenance projects.
- Completion of a survey of all States regarding their pavement management practices and methods for data collection and analysis. The survey forms a baseline for pavement management activities for the team, as well as a summary of best practices.
- Development of a *Pavement Management Software and Equipment Catalog*. This Catalog is an updated version of the very popular *Software Catalog* that was published in 1997. Distribution of the new Catalog is anticipated to begin in October 2001.

- A partnership with an AASHTO Special Task Force to investigate the feasibility of developing a management system for roadway hardware including guardrails, signs, crash cushions, signals, and similar items on and adjacent to highways. This project is in the early stages and a schedule for completion of products has not yet been established.
- Revision of educational materials for *Engineering Applications for Pavement Management Systems* (Demonstration Project 108b) and the holding of training sessions for interested State partners. This short course was designed to demonstrate best practices and techniques used by States and researchers to derive engineering information from existing pavement management data. The demonstration projects have generated considerable interest among State DOTs.
- Participation in the design, budget, and review of the draft versions of PONTIS 2000. This completely new version of the bridge management software is scheduled to be delivered in mid 2001, after extensive testing. The team serves on a number of World Road Association (PIARC), TRB, and AASHTO committees that provide guidance for the bridge evaluation and management activities and contribute to the training module for PONTIS 2000. The team has also set up a PONTIS system for use by the Federal Lands Highway Unit.
- Preparation of a Tunnel Management Guide, in cooperation with the Federal Transit Administration and the Office of Bridge Technology. Completion is anticipated in 2002. This project involves two phases. The first phase is to establish an inventory of highway and selected transit tunnels in the United States. Phase two will be the development of detailed guidance for evaluating tunnel components, establishing preservation and rehabilitation strategies, and integrating the system with bridge management systems.

The **Construction and System Preservation Team** works to develop analysis, evaluation, and monitoring tools to reduce the rate of highway deterioration by addressing deficiencies before they become a structural concern. The team also provides State DOTs with technical support, guidance, and training. Key to the success of these activities are the partnerships forged between AASHTO, the private sector, and FHWA. The following are some particularly notable accomplishments of this team:

- Support of AASHTO in the development and use of the Site Manager Construction Management System. Through a computerized database format, Site Manager offers State DOTs many potential benefits in managing construction projects.
- Initiation of the development of a National Training and Qualification Coordination Team consisting of representatives from various existing regional technician training groups, the private sector, FHWA, and the National Highway Institute (NHI). The team will respond to the training and certification needs of the State DOTs and industry in the area of highway construction and inspection.
- Involvement and coordination with the National Partnership for Highway Quality and its efforts to identify and promote activities and technologies that have the potential for improving the quality of the Nation's highways.
- Development of two NHI training courses on pavement preservation techniques: "Pavement Preservation: The Preventive Maintenance Concept" and "Pavement Preservation: Selecting Pavements for Preventive Maintenance."

- Initiation of the development of a new training course on the use of Critical Path Method scheduling to efficiently handle highway construction activities and minimize construction interface with the highway user.
- Distribution of a CD-ROM and several videotapes on pavement preservation techniques to all State DOTs.
- Development of a Customer Satisfaction Survey for measuring and tracking the public's satisfaction with the Nation's highway system through the use of nationwide random telephone interviews.

The **Evaluation and Economic Investment Team** works to develop, recommend, and advance Engineering/Economic Analysis (EEA) tools for use by State DOTs. These tools, which can be applied at multiple levels of the transportation system or to specific projects, allow competing investment options to be prioritized. They can also help agencies articulate the importance of and rationale for transportation investments. Current activities are:

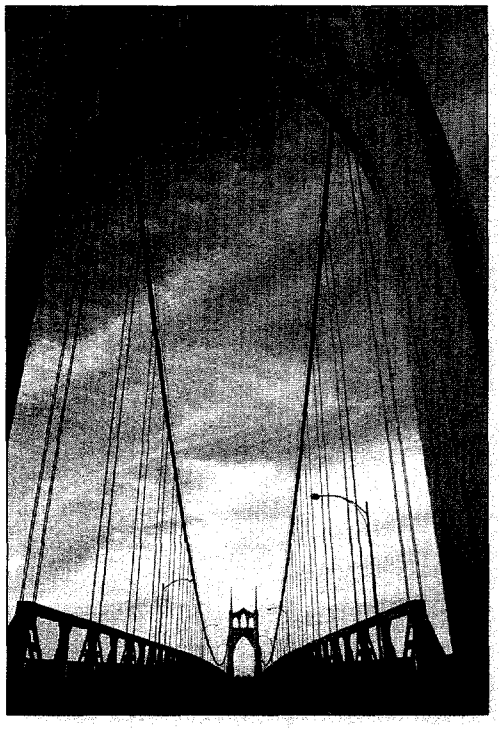
- Publication of the *Asset Management Primer*, an extensive document designed to explain the principles of Asset Management and how the Office of Asset Management can serve professionals within the transportation community. This document has helped many gain a better understanding of the benefits of Asset Management.
- Publication of *Primer: GASB 34*, which details the Governmental Accounting Standards Board's Statement 34, "Basic Financial Statements — and Management's Discussion and Analysis — for State and Local Governments." Like the *Asset Management Primer*, this document was designed to make a complex procedure easier to understand. GASB 34 calls for State, local, and municipal governments to calculate the original cost of infrastructure constructed or improved since 1980 and, for each reporting year, the cost of using the assets.
- Development of a generic Life Cycle Cost Analysis (LCCA) model that will include probabilistic or risk analysis features to support pavement design decisions. Nearly complete is a *LCCA Primer* designed to enhance understanding of LCCA and its potential applications.
- Initiation of a pilot project to evaluate use of the Highway Economic Requirements System (HERS) at the State level. FHWA currently uses HERS to estimate future national-level highway investment requirements. State representatives participating in the pilot project will explore the appropriateness of using the HERS application in program development, trade-off analysis, "needs" estimation, and for addressing the new GASB Statement 34 requirements.
- Development of a *Data Integration Primer* targeted for State DOTs, which contains state-of-the-art and best practice procedures for data integration. The key to building a successful Asset Management framework is integrating data management systems that are now generally independent, and at the same time including related information such as financial and customer data.

The Office of Asset Management made significant progress during the past year, and is well on the way to providing information, training, products, and tools of value to States and private sector partners. In fact "partnership" is the theme underscoring all of our activities. We look forward to more achievements with our partners in the coming year.

RELATED ACTIVITIES

Partnerships are crucial for Asset Management concepts to continue to gain widespread acceptance. Working with partners minimizes the potential to duplicate efforts and allows the leveraging of limited funds. Key partnerships with the Office of Asset Management have been formed with AASHTO, TRB, and various industry associations. The Office of Asset Management also participates in the National Research and Technology (R&T) Partnership Forum, which was established by FHWA, AASHTO, and TRB to coordinate research and technology activities.

AASHTO approved an Asset Management Strategic Plan in 1998. The AASHTO Asset Management Task Force, to which FHWA has provided extensive staff support, has expanded and updated the initial plan, which now has five key goals:



- Develop partnerships with public and private entities having an interest in and commitment to Asset Management.
- Develop and document an understanding of Asset Management and how it can be used by member States.
- Promote the development of Asset Management tools, analysis methods, and research topics.
- Communicate with and inform the leadership and member States on the use of Asset Management.
- Assist member States as they assess and implement Asset Management within their State.

Under the auspices of the National Cooperative Highway Research Program (NCHRP), an applied research program managed by TRB that focuses on the research requirements of State DOTs, the Office of Asset Management has been working with AASHTO since early 2000 to develop a *Guide to Asset Management.* This Guide will provide States with assistance, guidance, and tools for comprehensive Asset Management.

The Office also is working with the Asset Management subgroup of the National R&T Partnership Forum to identify major short and mid-term research theme areas; review existing R&T programs related to Transportation Asset Management; compare current activities to future requirements to determine gaps and duplications of effort; prioritize research gaps and identify high priority areas; and establish opportunities for partnering on current and future research.

Currently, TRB is considering the merits of a Transportation Asset Management Committee. FHWA and AASHTO suggested, and TRB concurred, that a Task Force should be set up to determine whether such a committee should eventually be appointed. The first meeting of the Task Force was held in September 2000. The Task Force will sponsor four Asset Management sessions at the TRB 2001 Annual Meeting and will subsequently develop a research agenda for future TRB and Asset Management efforts.

For further information on FHWA Asset Management initiatives, contact:

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